ABSTRACT

DISSERTATION/THESIS/RESEACH PAPER/CREATIVE PROJECT: The Electronic Properties of Hexagonal Boron Nitride and Graphene Nanoribbons

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DATE: July 2017

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The goal of this research is to study the electronic properties of hexagonal boron nitride and graphene nanoribbons. By studying these properties, it is easy to see how these materials pertain to energy storage and device fabrication. Both of these nanostructures are two-dimensional and can be characterized based on their edge shape, either by armchair or zigzag edge. The energy band structures, density of states, conductance and local density of states are calculated using a Tight-Binding Model with Huckel Theory and Green's Function Theory. In addition, Density Functional Theory will be used to compare results to the Tight-Binding Model. This third theory gives a detailed, new perspective on the electronic structure of these nanoribbons.